

## What is Claimed:

1        1. A method of marking for authentication a computer program with a bit-  
2 string pattern, the method comprising the steps of:

3            a) generating a bit-string pattern, each bit in the bit-string pattern having a  
4 binary value and at least one bit having a first value;

5            b) searching for at least one polymorphic statement in the computer  
6 program;

7            c) associating the one bit having the first value with the polymorphic  
8 statement found in step (b); and

9            d) altering the polymorphic statement;

10          wherein altering the polymorphic statement marks the computer program.

1        2. The method of claim 1 wherein generating the bit-string pattern includes  
2 generating multiple bits having first and second values;

3          associating each of the multiple bits with a polymorphic statement;

4          modifying a polymorphic statement corresponding to a bit having a first value;

5 and

6          leaving unmodified a polymorphic statement corresponding to a bit having a  
7 second value.

1        3. The method of claim 1 including the step of:

2            e) providing a pointer for locating a statement in the computer program;

3 and

4            searching for the one polymorphic statement in step (b) includes searching for  
5        the one polymorphic statement based on the statement located by the pointer.

1            4.        A method of marking, for authentication, source code of a computer  
2        program, designated as P, and having a complied version of the computer program,  
3        designated as E, the method comprising the steps of:

4            a)        generating a binary bit-string pattern, designated as B, having a  
5        predetermined value;

6            b)        modifying P to produce a separate program P1, such that the separate  
7        program P1, when compiled, functions identically to P;

8            wherein modifying P includes one of the following steps:

9            i) modifying inline assembly code of P based on B; and

10          ii) manipulating binary executable code of E based on B.

1            5.        The method of claim 4 wherein step (a) generates a binary bit-string  
2        pattern having a value not equal to zero.

1            6.        The method of claim 4 wherein step (i) includes correlating a binary bit  
2        in B to at least one statement of inline assembly code of P, and

3            modifying the one statement when the binary bit has a first value.

1            7.        The method of claim 6 wherein the first value of the binary bit is 1.

1            8.        A method of marking for authentication a computer program with a bit-  
2        string pattern, the bit-string pattern including a plurality of values, the method  
3        comprising the steps of:

- 4           a) associating the plurality of values with a respective plurality of  
5 predetermined computer statements, in which each predetermined computer statement  
6 is expressible as first and second equivalent operations;
- 7           b) selecting a first non-processed value of the bit-string pattern;
- 8           c) searching the computer program for at least one predetermined computer  
9 statement corresponding to the first non-processed value of the bit-string pattern;
- 10          d) expressing the predetermined computer statement found in step (c) as  
11 one of the first and second equivalent operations;
- 12          e) marking the first non-processed value of the bit-string pattern as  
13 processed; and
- 14          f) repeating steps (b) through (e) for each non-processed value of the bit-  
15 string pattern.

1           9. The method of claim 8 in which step (d) includes altering the  
2 predetermined computer statement from the first operation to the second operation, if  
3 the first non-processed value of the bit-string pattern is a value of 1.

1           10. The method of claim 8 including the step of:

2           generating the bit-string pattern having multiple bits of first and second values  
3 and a bit length smaller than or equal to a number of predetermined statements in the  
4 computer program.

1           11. The method of claim 8 including the step of:

2           g) providing a pointer for locating a predetermined statement in the  
3 computer program; and

4           searching the computer program of step (c) includes searching for the  
5       predetermined statement located by the pointer in step (g).

1           12. A method of authenticating a second computer program against a first  
2       computer program, the method comprising the steps of:

3           a)     accessing a bit-string pattern, each bit in the bit-string pattern having a  
4       binary value and at least one bit having a first value;

5           b)     searching for at least one polymorphic statement in the second computer  
6       program;

7           c)     associating the one bit having the first value with the polymorphic  
8       statement found in step (b);

9           d)     altering the polymorphic statement in the second computer program;

10          e)     comparing the polymorphic statement in the second computer program,  
11       after altering the polymorphic statement in step (d), against a corresponding  
12       polymorphic statement in the first computer program; and

13          f)     determining that the second computer program is a modified version of  
14       the first computer program, if the polymorphic statements compared in step (e) are  
15       not similar.

1           13. The method of claim 12 including the steps of:

2           (g)     associating another bit having a second value with another polymorphic  
3       statement found in step (b);

4           (h)     comparing the other polymorphic statement of step (g) against a  
5       corresponding polymorphic statement in the first computer program; and

6                   (i) determining that the second computer program is a modified version of  
7 the first computer program, if the polymorphic statements compared in step (h) are  
8 not similar.

1                  14. The method of claim 13 including the step of:

2                  repeating steps (b) through (f) for another bit in the bit-string pattern having a  
3 first value.

1                  15. The method of claim 13 including the step of:

2                  repeating steps (g) through (i) for another bit in the bit-string pattern having a  
3 second value.

1                  16. A method of authenticating a second computer program against a first  
2 computer program, the method comprising the steps of:

3                  a) accessing a first bit-string pattern, each bit in the first bit-string pattern  
4 having a binary value associated with a corresponding polymorphic statement in the  
5 first computer program;

6                  b) searching for at least one polymorphic statement in the second computer  
7 program;

8                  c) assigning a bit having a binary value to the polymorphic statement found  
9 in step (b);

10                 d) assigning another bit having a binary value to another polymorphic  
11 statement found in step (b);

12                 e) generating a second bit-string pattern including the bits assigned in steps  
13 (c) and (d); and

- 14           f) determining that the second computer program is a modified version of  
15       the first computer program, if the second bit-string pattern does not match the first  
16       bit-string pattern.